

# IBM C Set ++ News No.6

November 93

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## Hello Again

It's been six months since our last issue of C Set ++ News, and there's certainly a lot to tell you. In this issue:

- our new products
  - C Set ++ V2.1, page 2
  - C Set ++ FirstStep, page 6
  - C Set ++ for AIX/6000, page 16
  - Pricing and Packaging, page 7.. plus the latest on the US promotional prices
  - Documentation, page 14
- give us your feedback on our documentation, page 22
- feedback on ColoradOS/2, page 18
- what's happening with registration cards, page 20
- getting support - where to go for help, page 20

- our European friends join us, page 21
- C Set + + and DB2/2, page 27
- OS/2 <sup>™</sup> 2.1 APIs, page 32
- What Drag/Drop is all about, page 29
- last but not least, hints and tips, page 32.. including a special Q&A section on the Browser, page 41.. and how to save your hard disk space by using C Set direct from the CD-ROM, page 38

Now you know why it's been six months since the last issue! The C Set team has been working hard on the new offerings, so, sit back and read about what we've been up to. And as usual, tell us what you think - mail or fax the Reader's Reply Form at the end of the NL. We welcome your comments.

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## The Family Grows

The last six months has seen major activity on the C Set front. We started with the the announce of C Set + + 2.0 <sup>™</sup> in May. Then, in September 93, C Set + + for AIX <sup>™</sup> was announced by our colleagues in the AIX area (for details of that product, see the section called "Another member of the family"). Now - October 28th in the USA<sup>1</sup> to be exact - the family has grown again, with three new products: one replacement, two brand new. Here's what we've done:

- C Set + + V2.1, replacing V2.0
- C Set + + FirstStep, an entry level version of C Set + +
- C Set + + Class Libraries Source V2.1, source code for the UI and Collection class libraries

### C Set + + V2.1

First, a quick review of what components make up C Set + + . There are three major parts:

1. C/C+ + Tools (the package name for the grouping of the compiler, debugger, EXTRA code analyzer, browser and class libraries)
2. WorkFrame/2 <sup>™</sup> (the development environment)

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<sup>1</sup> This is the announce date for C Set + + in the USA. Other countries may have announced at a later date.

3. Developer's Toolkit (TK for short, it has resource and other tools in it)

This new release builds on the 2.0 version of C Set + + , with enhancements in four major areas:

1. KASE:Set <sup>TM 2</sup> makes its debut as a visual User Interface builder
2. Toolkit 2.1 is now available in the product, allowing you to take full advantage of OS/2 2.1
3. WorkFrame/2 has undergone a facelift, and returns as V2.1, utilizing the object-oriented Workplace Shell to provide a completely new development environment
4. The User Interface Class Library has been enhanced with the addition of Drag/Drop classes

## **KASE:Set**

Building a CUA 91 UI just became simpler with the availability of KASE:Set. Instead of slowly building your UI from scratch using PM or the UI class library, you can be up and running in a fraction of the time with exactly the UI you want, backed by expert level source code, all courtesy of KASE:Set. All it takes is an idea of what you want and the ability to point and click. You choose your windows, dialogs, menus, notebooks, all the components of your UI, and KASE:Set turns that into expert code in C or C+ + your choice. And anyone who hates to comment code is in for a treat: KASE:Set does it for you!

And there's more. Because KASE:Set defines the linkages between the UI components and application logic, providing hooks to user code, it's easy to integrate application logic with the source code you produce. That way you can spend your time on the application logic rather than the UI.

Although experienced programmers can use KASE:Set to increase their productivity, building new applications or renovating old ones, novice developers will be particularly glad of KASE:Set. They can "read along with KASE:Set" through the expert level code, with the comments explaining what's being done and how. It's an excellent way to learn.

How to get started? With KASE:Set, there are 5 steps:

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<sup>2</sup> KASE:Set is a trademark of KaseWorks Inc

1. Prototype the individual elements of your UI using KASE:Set's modular interface designers
2. Combine the reusable UI components and your application logic into a complete UI definition
3. Generate the source code in C or C++
4. Edit and integrate any additional logic into the resulting code using whichever editor you want
5. Compile the source using C Set++

You're done. No run-times. No royalties. No proprietary languages. Just a business critical application with an expertly coded UI.

KASE:Set is from KASEWORKS Inc, and is an introductory product based on a subset of features found in their KASE:VIP tool. Not sold separately by KASEWORKS or IBM, it is packaged along with C Set++, and comes with its own documentation.

## **Toolkit V2.1**

Version 2.0 of C Set++ contained Toolkit 2.0. To take advantage of OS/2 2.1 (e.g. the new APIs, the kernel debugger, MPM/2) requires TK 2.1, and that's now part of C Set++. Just in case you're not sure what the TK is, it's full of build, resource, PM, and MPM/2 tools, as well as the SOM precompiler. And of course, there are sample programs. TK is mandatory for use with the C/C++ Tools part of C Set++.

## **WorkFrame/2 V2.1**

WorkFrame organizes your files into logical units or projects. It's also a tool integrating environment that allows you to use your favourite tools be they DOS, Windows, or OS/2.

WorkFrame/2 now takes advantage of the Workplace Shell. It has all the function of V 1.1 plus:

- it adapts to the user's project environment, rather than the other way around
- projects can consist of source and object files spanning multiple directories, and can have one target such as .EXE or .DLL
- it associates each project with multiple actions, including compiling, debugging, making, linking, browsing, profiling, and pre-processing
- multiple developers can now work concurrently on a single project by plugging in their own source control system

Version 1.1 continues to be provided in the package, so you get both versions when you buy V2.1 of C Set + + .

### **User Interface Class Library**

UICL has grown. There's been around a 15% growth in the functions, primarily due to Drag/Drop support (many of the classes have been enhanced to support Drag/Drop directly). Also included are:

- New Classes:
  - IGraphicPushbutton - Allowing the full use of bitmaps and icons on push buttons.
  - IThread:: Cursor - allowing the threads in an application to be iterated.
- New Functions
  - IWindow:
    - Zorder manipulation functions that allow the tab order of windows to be changed dynamically.
    - Constructor to allow the wrapping of a generic window handle.
    - Send/Post of events added.
    - Support to disable the update of a window.
  - INotebook
    - Sizing functions allowing a notebook page to be sized to the window stored in it.
  - IFrameWindow
    - Sizing functions allowing a frame window to be sized to the client window.
    - Functions for querying and setting the frame border size.
  - IContainerControl
    - New functions for querying the contents of data in a column and for rendering the data in all supported formats.
    - New function to query the splitbar.
  - IMultiCellCanvas
    - Development functions to allow movable grid lines in the canvas to help adjust the initial position of the canvas contents.
  - StaticText
    - Functions to allow the use of halftone, underscore, and strikeouts.
- Updated Hard and Soft Copy Documentation and sample programs.

## Plus ...

CSDs 1 and 2 are integrated into V2.1 of C Set + + . And there are new packaging and pricing options. See "Packaging and Pricing" to find out what C Set + + looks like these days.

## C Set + + FirstStep

If you're a new or non-professional programmer, a student, getting started in C or C+ + , or just don't want to spend a lot of money, C Set + + FirstStep is for you. It's a slimmed down version of C Set + + at a correspondingly lower price. You get:

- the same compiler/debugger tools as C Set + + V2.1 except for optimization
- three class libraries
  - Standard Classes (Task, Iostream, Complex)
  - Collection Classes
  - Application Support Classes (Date, String, Time)
- Toolkit V2.1
- WorkFrame/2 V1.1. Notice that's 1.1, not the later 2.1 version.

EXTRA (the code analyzer) and the Browser aren't in FirstStep, nor is the User Interface Class Library. KASE:Set isn't there either. None of these things are essential to begin C or C+ + , but they're tremendously useful once you get going, or if you program for a living. If you think you need those, then you need C Set + + V2.1.

One other thing to note about FirstStep. Program Service is NOT provided for this product, although users can find hints and tips on the CompuServe <sup>TM</sup> <sup>3</sup> service.

Now to a most important consideration: money. What is the correspondingly lower price we mentioned? Check out the Packaging and Pricing section, and see how little it costs to join the C Set family.

## C Set + + Class Libraries Source

Source code for the UI and Collection class libraries is now available. This hasn't been introduced as part of the main C Set + + product; instead it's a separate product with its own packaging and price tag.

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<sup>3</sup> <sup>TM</sup> Trademark or registered trademark of CompuServe Inc

## **What about me? - I'm not in the USA**

All the stuff you just read on content of the products is valid wherever you live. The pricing and packaging options may not be. The products are developed in IBM's Software Solutions laboratories in Boeblingen, Cary, Lexington, and Toronto, and are released to the USA, Canada, and three geographical groups of countries: Latin America, Asia Pacific, and Europe/Middle East/Africa. Within these groups, each country is decides exactly when and how to announce the products, based on specific needs, wants and customs. This means that they may need to change the product to take into account local rules and regulations, e.g. have different ordering instructions, maybe new part numbers, include local licensing terms, and establish local prices. As a result, many countries often announce later than the USA does, and also have a later GA (General Availability) date than the USA. This has been the case with the announcements you're reading about now. At time of going to press, most countries in the world were planning to announce this version in either November or December 1993. To find out the details on your specific country announcement please contact your local IBM representative.

## **And I'm in Asia Pacific**

Both C Set + + and FirstStep were released to the countries in this geography (except Japan) at the end of October.

At press time, Australia, Singapore, Malaysia, Hong Kong/China and most of the single byte countries have announced our new products. The AP announcement letters are AP73-1471 C Set + + ) and AP1473 (FirstStep), if you want more details, or check with your usual channel.

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## **Pricing and Packaging**

### **Packaging**

A new packaging option is available for both V2.1 and FirstStep: CD-ROM Pak. This is a CD-ROM with Group 1 documentation (how to and basic manuals) included in hardcopy. You can still buy the CD-ROM on its own - it has all the documentation softcopy - so now there are three choices:

1. diskette version with group 1 manuals hardcopy, group 2 softcopy
2. CD-ROM version, all documentation in softcopy
3. CD-ROM Pak, group 1 manuals in hardcopy, group 2 softcopy

Because of the new licensing options, the volume packs, and the upgrades from previous products, there are many part numbers for you to think about when you're ordering any of the new products. We're not listing every part number here, just the most common ones. For example, we don't discuss what it costs to buy any of the three components (C/C++ Tools, WorkFrame, or Toolkit) separately. If you don't see what you want, or you need any further help, please contact IBM through your local source (IBM office, IBM rep, dealer/distributor, CompuServe, IBMLink TalkLink BBs, or [workframe@vnet.ibm.com](mailto:workframe@vnet.ibm.com) or [cset2@vnet.ibm.com](mailto:cset2@vnet.ibm.com), etc.).

## USA Ordering and Prices

### A Promotion has been announced

Since the announcement of C Set ++ V2.1 was made on October 28th, a promotion has been arranged to offer reduced prices to eligible customers.

You are eligible if you fall into one of these two categories:

1. if you acquired C Set ++ V2.0 by upgrading from either WorkSet/2 or C Set/2 V1.0, or
2. if you acquired C Set ++ V2.0 after September 9, 1993.

Let's say that another way:

- If you bought the old C Set/2 or WorkSet/2 product, then bought C Set ++ , you are eligible for the promotion. It doesn't matter when you bought any of the products, just that you went from V1.0 to V2.0, and now want V2.1.
- If the first product you bought was C Set ++ V2.0, then you are eligible *if* you acquired it *after* September 9th, 1993.

Before you rush off and order V2.1, be aware of these things:

- Promotional prices are available *only* from the IBM 1-800-3IBM-OS2 number or your dealer. The promotion may vary from dealer to dealer.
- If your V2.0 of C Set ++ was not acquired directly from IBM, proof of purchase (copy invoice) will be required if you are purchasing from the 1-800 number.
- Orders *must* be placed on or before January 31, 1994.
- The promotion cannot be combined with any other discount or allowance.



Did you note the third point? The promotion is a limited time. It expires on **January 31, 1994**. Then the prices go back to the previous "street" and announced prices.

## Parts and Prices

Now to the part you've been waiting for: the prices and the part number you order, if you qualify. There are just three part numbers, one for CD-ROM, one for 3.5" diskette, and one for the CD-ROM Pak. They are:

| <i>Description</i>                       | <i>Part Number</i> | <i>Price</i> |
|--|--------------------|--------------|
| <b>C Set + + V2.1 3.5" Upgrade</b>       | <b>82G3788</b>     | <b>\$99</b>  |
| <b>C Set + + V2.1 CD Upgrade</b>         | <b>82G3789</b>     | <b>\$59</b>  |
| <b>C Set + + V2.1 CD-ROM Pak Upgrade</b> | <b>82G3790</b>     | <b>\$79</b>  |

**Note:** Once the promotion ends (January 31, 1994), the prices will revert to those below. Those customers not eligible for the promotion will pay the charges listed next.

## Non-Promotion Pricing

These are the prices that you pay

1. if you are not eligible for the promo
2. after January 31, 1994 if you are eligible for the promo

These prices come in two flavours: IBM announced price and sometimes a "street" price. The latter is a lower-than-announced price that you pay at the IBM 1-800-3IBM-OS2 number.

Things to note:

- not every part or product has a "street" price.
- the quoted "street prices" are available ONLY at the 1-800-3IBM-OS2 phone number, **after** the price promotion expires.
- your dealer/distributor may also sell for less.
- not every pricing option is available everywhere, e.g. the volume packs are not sold through the 1-800-3IBM-OS2 number. Any restrictions are noted in the appropriate text.
- 5.25" diskette version is no longer available.

When you buy C Set + + V2.1 or FirstStep, you now have several options open to you:

- single unit pricing (price for buying one copy)
- additional licensing packs (you may know this as LAN licensing)
- volume packs (packs of 5, 10, 25, 50 and 100 at a lower price)
- upgrade prices from C Set/2, WorkSet/2, and C Set + + V2.0

## How (and what) to order

Decide which of the sections below refers to you, and read what pricing options/restrictions apply. Also, check if there's any promotion that IBM is offering that might give you a lower price.

- 1 (a) you don't have a C Set product today  
(b) you want to buy a single copy

| Description         | Media     | USA part | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|-----------|----------|-------------|----------------|
| C Set + + 2.1       | 3.5"      | 82G3732  | \$695       | \$459          |
| C Set + + 2.1       | CDROM     | 82G3735  | \$595       | \$395          |
| C Set + + 2.1       | CDROM Pak | 82G3736  | \$645       | \$425          |
| C Set + + FirstStep | 3.5"      | 82G3744  | \$149       | \$99           |
| C Set + + FirstStep | CDROM     | 82G3746  | \$129       | \$85           |
| C Set + + FirstStep | CDROM Pak | 82G3747  | \$149       | \$99           |

- 2 (a) you have a C Set product already, on 3.5" or 5.25" diskettes  
(b) you want C Set + + V2.1 on 3.5" diskettes  
(c) you want to buy a single copy

| What you have today | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|---------------|-------------|----------------|
| WorkSet/2           | 82G3900       | \$265       | \$175          |
| C Set/2             | 82G3901       | \$265       | \$175          |
| C Set + + V2.0      | 82G3902       | \$265       | \$175          |

- 3 (a) you have a C Set product already, on 3.5" or 5.25" diskettes  
(b) you want C Set + + V2.1 on CD-ROM, no hardcopy doc  
(c) you want to buy a single copy

| What you have today | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|---------------|-------------|----------------|
| WorkSet/2           | 82G3904       | \$165       | \$109          |
| C Set/2             | 82G3905       | \$165       | \$109          |
| C Set + + V2.0      | 82G3906       | \$165       | \$109          |

- 4 (a) you have a C Set product already, on 3.5" or 5.25" diskettes  
(b) you want C Set + + V2.1 on CD-ROM Pak  
(c) you want to buy a single copy

| What you have today | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|---------------|-------------|----------------|
| WorkSet/2           | 82G3908       | \$215       | \$139          |
| C Set/2             | 82G3909       | \$215       | \$139          |
| C Set + + V2.0      | 82G3910       | \$215       | \$139          |

- 5 (a) you have a C Set product already, on CDROM  
 (b) you want C Set + + V2.1 on 3.5" diskettes  
 (c) you want to buy a single copy

| What you have today | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|---------------|-------------|----------------|
| C Set + + V2.0      | 82G3903       | \$265       | \$175          |

- 6 (a) you have a C Set product already, on CDROM  
 (b) you want C Set + + V2.1 on CDROM again  
 (c) you want to buy a single copy

| What you have today | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|---------------|-------------|----------------|
| C Set + + V2.0      | 82G3907       | \$165       | \$109          |

- 7 (a) you have a C Set product already, on CDROM  
 (b) you want C Set + + V2.1 on CDROM Pak  
 (c) you want to buy a single copy

| What you have today | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|---------------|-------------|----------------|
| C Set + + V2.0      | 82G3911       | \$215       | \$139          |

\*\*\*\* BUYING IN VOLUME \*\*\*\*

\*\* First, consider if any promotion is currently available. If so, \*\*  
 \*\* then it may be cheaper for you to use the promotion. For example, \*\*  
 \*\* if you own 25 copies, you could buy one of the volume packs we \*\*  
 \*\* show below. However, if you qualify for the promotion we mention \*\*  
 \*\* earlier, then it makes more sense to upgrade using the promotion \*\*  
 \*\* discount. Be aware, though, that the promotion does not allow any \*\*  
 \*\* volume purchase - you must do a one for one upgrade. That means \*\*  
 \*\* if you have 5 copies and you qualify, you can't order 25 at the \*\*  
 \*\* promotional prices. You can only buy 5, one for each of the \*\*  
 \*\* copies you own. \*\*

- 8 (a) you want to buy C Set + + V2.1 in volume  
 (b) you want 3.5" diskettes

| What you have today | How many you want | What to order | Price    |
|---------------------|-------------------|---------------|----------|
| Doesn't matter      | 5                 | 82G3924       | \$2,260  |
| Doesn't matter      | 10                | 82G3925       | \$4,170  |
| Doesn't matter      | 25                | 82G3926       | \$9,555  |
| Doesn't matter      | 50                | 82G3927       | \$17,370 |
| Doesn't matter      | 100               | 82G3928       | \$31,270 |

- NOTE: 1. Volume Packs are ONLY available from the 1-800-IBM-CALL number,  
 or from your IBM representative.  
 2. Not available from dealers or distributors.  
 3. There are no "street" prices for Volume Packs

- 9 (a) you want to buy C Set + + V2.1 in volume  
 (b) you want CD ROM, no hardcopy doc

| What you have today | How many you want | What to order | Price    |
|---------------------|-------------------|---------------|----------|
| Doesn't matter      | 5                 | 82G4451       | \$1,930  |
| Doesn't matter      | 10                | 82G4452       | \$3,570  |
| Doesn't matter      | 25                | 82G4453       | \$8,180  |
| Doesn't matter      | 50                | 82G4454       | \$14,870 |
| Doesn't matter      | 100               | 82G4455       | \$26,770 |

- NOTE: 1. Volume Packs are ONLY available from the 1-800-IBM-CALL number, or from your IBM representative.  
 2. Not available from dealers or distributors.  
 3. There are no "street" prices for Volume Packs

- 10 (a) you want to buy C Set + + V2.1 in volume  
 (b) you want CD ROM Pak (CD ROM with hardcopy doc)

| What you have today | How many you want | What to order | Price     |
|---------------------|-------------------|---------------|-----------|
| Doesn't matter      | 5                 | 82G4456       | \$2,095   |
| Doesn't matter      | 10                | 82G4457       | \$3,870   |
| Doesn't matter      | 25                | 82G4458       | \$8,870   |
| Doesn't matter      | 50                | 82G4459       | \$16,120  |
| Doesn't matter      | 100               | 82G4460       | \$29,0020 |

- NOTE: 1. Volume Packs are ONLY available from the 1-800-IBM-CALL number, or from your IBM representative.  
 2. Not available from dealers or distributors.  
 3. There are no "street" prices for Volume Packs

- 11 (a) you have now got C Set + + V2.1  
 (b) you want one extra license but don't want the actual physical package shipped to you - you will copy the product yourself, or allow ONE more user LAN access  
 (c) you DON'T want IBM to send you proof of this extra license

| What you have today | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|---------------|-------------|----------------|
| C Set + + V2.1      | 82G3916       | \$585       | \$386          |

- 12 (a) you have now got C Set + + V2.1  
 (b) you want one extra license but don't want the actual physical package shipped to you - you will copy the product yourself, or allow ONE more user LAN access  
 (c) you DO want IBM to send you proof of this extra license

| What you have today | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|---------------|-------------|----------------|
| C Set + + V2.1      | 82G3920       | \$585       | \$386          |

- 13 (a) you have now got C Set + + V2.1  
 (b) you want X extra licenses but don't want the actual physical packages shipped to you - you will copy the product yourself, or allow X more users LAN access

| What you have today | How many extra licenses you want | What to order | Price    |
|---------------------|----------------------------------|---------------|----------|
| -----               | -----                            | -----         | -----    |
| C Set + + V2.1      | 5                                | 82G3929       | \$1,900  |
| C Set + + V2.1      | 10                               | 82G3930       | \$3,510  |
| C Set + + V2.1      | 25                               | 82G4443       | \$8,040  |
| C Set + + V2.1      | 50                               | 82G4444       | \$14,620 |
| C Set + + V2.1      | 100                              | 82G4445       | \$26,320 |

- NOTE: 1. Additional Licensing Volume Packs are ONLY available from the 1-800-IBM-CALL number, or from your IBM Representative  
 2. Not available from dealers or distributors.  
 2. There are no "street" prices for Addition License Volume Packs

- 14 (a) you want the source code for the class libraries

| What you have today | What to order | Ann'd price |
|---------------------|---------------|-------------|
| -----               | -----         | -----       |
| Doesn't matter      | 61G1400       | \$695       |

- NOTE: 1. The Source Code product is ONLY available from the 1-800-IBM-CALL number, or from your IBM representative.  
 2. It is not available from dealers or distributors.  
 3. There is no "street" price for the Source Code product

- 15 (a) you want hardcopy documentation for C Set + + V2.1

| What you have today | Which doc | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|-----------|---------------|-------------|----------------|
| -----               | -----     | -----         | -----       | -----          |
| Doesn't matter      | Group 1   | 82G3741       | \$55        | \$36           |
| Doesn't matter      | Group 2   | 82G3742       | \$90        | \$60           |

- NOTE 1. 1-800-3IBM-OS2 sells documentation in groups and singly  
 2. 1-800-IBM-CALL sells documentation in groups only  
 3. Dealers/distributors sell documentation in groups and singly  
 4. IBM reps sell documentation in groups only

- 16 (a) you want hardcopy documentation for C Set + + FirstStep

| What you have today | Which doc | What to order | Ann'd price | 1-800-3IBM-OS2 |
|---------------------|-----------|---------------|-------------|----------------|
| -----               | -----     | -----         | -----       | -----          |
| Doesn't matter      | Group 1   | 82G3755       | \$20        | \$20           |
| Doesn't matter      | Group 2   | 82G3756       | \$74        | \$50           |

- NOTE 1. 1-800-3IBM-OS2 sells documentation in groups and singly  
 2. 1-800-IBM-CALL sells documentation in groups only  
 3. Dealers/distributors sell documentation in groups and singly  
 4. IBM reps sell documentation in groups only

Whew! I hope you're still with us - that's quite a lot of information, but it reflects our commitment to meeting our customer's buying needs. And we're not finished yet. How do you get documentation? What's in the documentation groups? How do you order the groups? What softcopy comes with which packaging option? Lots of documentation questions; lots of answers!

## Documentation

Manuals for both C Set + + and FirstStep come singly and in two groups. The groups are:

| <i>Product</i>             | <i>Which manuals</i> | <i>Part Number</i> |
|----------------------------|----------------------|--------------------|
| <i>C Set + +</i>           | <i>Group 1</i>       | <i>82G3741</i>     |
| <i>C Set + +</i>           | <i>Group 2</i>       | <i>82G3742</i>     |
| <i>C Set + + FirstStep</i> | <i>Group 1</i>       | <i>82G3755</i>     |
| <i>C Set + + FirstStep</i> | <i>Group 2</i>       | <i>82G3756</i>     |

Which manuals are in which groups?

| <i>Product</i>        | <i>Manual</i>                                      | <i>Grp</i> | <i>Part Number</i> |
|-----------------------|--|------------|--------------------|
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools Prog'g Guide</i>                   | <i>1</i>   | <i>S61G1181</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools Debugger Intro</i>                 | <i>1</i>   | <i>S61G1184</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools Browser Intro</i>                  | <i>1</i>   | <i>S61G1397</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools EXTRA Intro</i>                    | <i>1</i>   | <i>S61G1398</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools Reference Summary</i>              | <i>1</i>   | <i>S61G1441</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools UICL User's Guide</i>              | <i>1</i>   | <i>S82G3743</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools Installation Card</i>              | <i>1</i>   | <i>none</i>        |
| <i>C Set + + V2.1</i> | <i>WorkFrame/2 V1.1 Intro</i>                      | <i>1</i>   | <i>S61G1428</i>    |
| <i>C Set + + V2.1</i> | <i>WorkFrame/2 V2.1 Intro</i>                      | <i>1</i>   | <i>S82G3740</i>    |
| <i>C Set + + V2.1</i> | <i>Developer's Toolkit Getting Started</i>         | <i>1</i>   | <i>none</i>        |
| <i>C Set + + V2.1</i> | <i>MMPM/2 Getting Started</i>                      | <i>1</i>   | <i>none</i>        |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools C+ + Language Reference</i>        | <i>2</i>   | <i>S61G1185</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools C Language Reference</i>           | <i>2</i>   | <i>S61G1399</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools C Library Reference</i>            | <i>2</i>   | <i>S61G1183</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools Collection Class Lib Reference</i> | <i>2</i>   | <i>S61G1178</i>    |
| <i>C Set + + V2.1</i> | <i>C/C+ + Tools UICL Reference</i>                 | <i>2</i>   | <i>S82G3738</i>    |

| <i><b>Product</b></i>              | <i><b>Manual</b></i>  | <i><b>Grp</b></i> | <i><b>Part Number</b></i> |
|------------------------------------|---|-------------------|---------------------------|
| <i><b>C Set + + V2.1</b></i>       | <i><b>C/C+ + Tools Standard Class Lib Reference</b></i>           | <i><b>2</b></i>   | <i><b>S61G1180</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools Programming Guide</b></i>                   | <i><b>1</b></i>   | <i><b>S82G3748</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools Debugger Intro</b></i>                      | <i><b>1</b></i>   | <i><b>S82G3749</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools Reference Summary</b></i>                   | <i><b>1</b></i>   | <i><b>S82G3750</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools Read Me First</b></i>                       | <i><b>1</b></i>   | <i><b>none</b></i>        |
| <i><b>FirstStep</b></i>            | <i><b>WorkFrame/2 V1.1 Intro</b></i>                              | <i><b>1</b></i>   | <i><b>S61G1428</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>Developer's Toolkit Getting Started</b></i>                 | <i><b>1</b></i>   | <i><b>none</b></i>        |
| <i><b>FirstStep</b></i>            | <i><b>MMPM/2 Getting Started</b></i>                              | <i><b>1</b></i>   | <i><b>none</b></i>        |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools C+ + Language Ref</b></i>                   | <i><b>2</b></i>   | <i><b>S82G3760</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools C Language Reference</b></i>                | <i><b>2</b></i>   | <i><b>S82G3761</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools C Library Reference</b></i>                 | <i><b>2</b></i>   | <i><b>S82G3759</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools Collection Class Library Reference</b></i>  | <i><b>2</b></i>   | <i><b>S82G3757</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools Standard Class Library Reference</b></i>    | <i><b>2</b></i>   | <i><b>S82G3758</b></i>    |
| <i><b>FirstStep</b></i>            | <i><b>FirstStep Tools Application Class Library Reference</b></i> | <i><b>2</b></i>   | <i><b>S82G3905</b></i>    |
| <i><b>Class Library Source</b></i> | <i><b>Class Library Source: Getting Started</b></i>               | <i><b>n/a</b></i> | <i><b>none</b></i>        |

## What format comes with what?

Read across the table to see in what formats the documentation is shipped with the products. Remember, we ship you IBM BookManager Read so you can read the .BOO files.

Also, note that the IPF and BookManager (.BOO) files may be accessed either from your hard drive or directly from the CD-ROM.

| <i>Product</i>             | <i>Medium</i>     | <i>Group 1</i>                                | <i>Group 2</i>                  |
|----------------------------|-------------------|---|---------------------------------|
| <i>C Set + + V2.1</i>      | <i>Diskette</i>   | <i>Hardcopy</i>                               | <i>IPF files</i>                |
| <i>C Set + + V2.1</i>      | <i>CD-ROM</i>     | <i>Postscript and .BOO files</i>              | <i>IPF files and .BOO files</i> |
| <i>C Set + + V2.1</i>      | <i>CD-ROM Pak</i> | <i>Hardcopy and Postscript and .BOO files</i> | <i>IPF files and .BOO files</i> |
| <i>C Set + + FirstStep</i> | <i>Diskette</i>   | <i>Hardcopy</i>                               | <i>IPF files</i>                |
| <i>C Set + + FirstStep</i> | <i>CD-ROM</i>     | <i>Postscript</i>                             | <i>IPF files</i>                |
| <i>C Set + + FirstStep</i> | <i>CD-ROM Pak</i> | <i>Hardcopy and Postscript</i>                | <i>IPF files</i>                |

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## Another Member of the Family

C Set + + for AIX/6000 Version 2 is the follow-on version of XL C+ + Compiler/6000 V1. It consists of a native, optimizing compiler which compiles both C and C+ + programs, a browser, a HeapView debugger, a test coverage analyser and a set of class libraries. All tools that are shipped with C Set + + for AIX/6000 support both C and C+ + program development.

### C and C+ + Browser

The browser is a post-compilation static analysis tool which allows users to examine their programs in many ways by formulating queries of the program database. This browser has been enhanced to support C as well as C+ + .

### Heapview Debugger

The HeapView debugger is a new tool in the package. It enables users to detect memory corruption problems due to the dynamic nature of allocating and deallocating memory.

### Test Coverage Tool

The test coverage tool provides information about how often different statements in the code are used when the program is executing. Using this tool allows for quick identification of areas in the program that are not executed or tested. This tool has been enhanced to support C.

### Class Libraries

Class libraries include:

- USL<sup>4</sup> Class Libraries: iostreams, task and complex

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<sup>4</sup> USL is a registered trademark of UNIX Systems Laboratories Inc.



- Collection class library
- Application Support class library

#### Class library example

- InterViews 3.1

In addition, C Set + + for AIX/6000 supports the following AIX tools:

- debugger (dbx)
- linker (ld)
- ixttools (i.e. prof, gprof, nm, vgrind, lex, yacc, cflow, cxref and lint)

C Set + + for AIX/6000 V2 shares family ties with C Set + + for OS/2 by sharing the same C+ + front end, using the same USL class libraries, and a Browser derived from the same source. Planned to be available in December 93 (with the CD-ROM coming a little later, this cousin to C Set + + for OS/2 has 5765-186 as its program number.

For further details, consult your regular IBM channels or an Authorised Business Partner.

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## The Printed Word

You may have heard the rumour about an ICLUI (or UICL as it's also known) book coming out, written by the folks who wrote the product.

It's no rumour. Although the book isn't likely to be published until Winter 94, we can tell you that the title of the book currently is "OS/2 V2.1 C+ + Class Library Power GUI Programming"

The book will cover all aspects of programming using the User Interface class library. Included are class descriptions, design rationale, and how to add extensions as well as sample programs, answers to frequently asked questions, and problem determination and tuning techniques.

The authors are, in alphabetical order, Bill Law, Kevin Leong, Bob Love, and Hiroshi Tsuji. Publisher is Van Nostrand Reinhold.

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## International Phoenix Alliance

One topic that turns up in our mailbag quite regularly is the International Phoenix Alliance. Customers want to know what it is we're running and can they join. The truth is that it isn't IBM. The Alliance consists of OS/2 customers who have a continuing interest in OS/2 and its products. They see the role of their organization as 'the voice of the small user', but welcome all users with concerns, ideas and an interest in the future of OS/2.

Membership is open to anyone anywhere, from the individual home user to the small business owner, from the IS professional at major corporations, to the college student. Dues are US\$32. For further details contact Jack Hiatt in the USA at 404-445-6453, or 74160,2656 on CompuServe.

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## Thank You

With another version of C Set out the door, it is timely to remember a particular group of people who helped make the product what it is. I'm not talking about the IBM developement team who put it together, but about you, our customers. Thousands of you, both internally and externally, put C Set products through their paces, giving us valuable feedback. You found bugs, made suggestions, and kept us - and continue to keep us - on our toes. From all of us in OS/2 C/C+ + Development, our sincerest thanks.

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## Rocky Mountain High

Where were you the first week in November? If you weren't at ColoradOS/2 in Colorado Springs, USA, you missed a treat. You also missed meeting the editor of this newsletter. ColoradOS/2 is a week long conference for OS/2 lovers - programmers, writers, technical coordinators, anyone, as long as they are technically oriented. The time is packed with sessions on anything and everything on OS/2, from becoming an OS/2 consultant to the mysteries of device drivers. And there are always sessions on various aspects of C Set.

This year's conference was kicked off by Wayne Kovsky, the originator and organizer of the whole thing, followed by a keynote address by John Soyring. Each morning there was a keynote speaker, then the rest of the day was given over to technical sessions. Each time slot there are 8-10 topics to choose from, but as they are all repeated a couple of times over the week, with careful planning you can attend everything you want without missing anything. A splendid lunch was provided each day, and refreshments at the

breaks. Wayne even had Jolt served in large amounts - all bases covered!

C Set + + was well represented at the conference, with Ian Ameline reprising his "Optimizations: Tips & Techniques" and "Writing High Performance Applications" sessions, and the User Interface Class Library folks there in full force. Kevin Leong, Hiroshi Tsuji, and Bill Law initiated their attendees into the arcane world of the UICL with 3 sessions:

- Window and Handler Frameworks
- Using the Advanced Layout Controls of the C Set + + Tools
- Direct Manipulation

In addition, your editor was around as an attendee, chatting to customers about the latest announce, answering marketing queries, and taking the opportunity to sound people out on requirements and future direction for C Set + + .

Lest you think all the work is done in the presentation/class sessions, I should point out that one of the most valuable aspects of this technical conference is - to use familiar computing terms - the networking and the peer to peer connection that goes on, in the breaks, at lunch, and into the evenings. Each day at 5:15, the audience reconvened in the main ballroom for a Q&A session that went on as long as was needed, which was often several hours. The amount of useful information, technical help, and just-in-case facts passed around was staggering. And it was augmented by European information too - this year, a full quarter of the attendees were from outside the USA, and I don't just mean Canada (although we were well represented). There were Belgians, Dutch, Germans, and the French there, to name a few.

How did it all end? Bjarn Stroustrup, of C+ + fame, gave the closing keynote speech, reviewing the history of C+ + , and his feelings on its use. He fielded lots of questions and then joined us for lunch where he was available for questions and consultation.

If you're sorry you missed it, there'll be another one next year, scheduled for November. We'll carry details when it gets closer. Any questions, Wayne Kovsky's at 719-481-3389 (voice), 719-481-8069 (fax).

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## **We Know Who You Are**

But if we don't, we'd like to. It's vital that you return the registration card you find in your product, so we can keep you up to date on the C Set family. In North America, your cards come to Toronto where we record your data. There's something in it for you: along with your support letter, we mail you a poster showing the User Interface Class Library classes. The support letter gives you a Customer Registration Number. This number isn't a replacement for any other customer number you may have been assigned by other IBM depts. It uniquely identifies you to the C Set team, and saves you having to quote your customer details over and over.

If you're still waiting for your letter and poster, don't despair. We have received thousands of the cards, but we're well on the way through them all.

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## **Help!**

Many customers have asked about support channels - how you "officially" contact us for help. There are lots of ways, depending on where you are and what you feel like doing - phoning, or messaging.

### **Telephone**

In the USA and Canada, you can call 1-800-237-5511 to speak to a support person. This number connects you with the IBM Software Support Service, who handle our first level support. Have your customer number ready and identify yourself as a C Set user. You'll be given a number we can both use to track your problem.

### **IBMLink - TalkLink**

In Canada and the USA, you can append C Set questions into the C-SET2 forum in the BBS section of TalkLink. Whilst some IBMers do log on directly onto IBMLink, mostly the questions are answered by C Set developers directly from our own internal electronic network which has a rapid turnaround tie-in with TalkLink's BBS's. We see the TalkLink BBS as a Customer Forum (CFORUM). You'll be talking with a whole bunch of developers on all the components of C Set, as well as experienced customers. These customers are not just from North America. As you can read in another article in this issue, European customers are also active on C-SET2.

Code and other files such as CSDs and this newsletter are placed on TalkLink, usually in the OS/2 Selected Fixes area. Such actions are publicized in the forum, as are product announcements and other useful information.

## CompuServe

On this worldwide system, you'll find us in OS2DF1. We have two fora: C SET2 and C+ + . You'll find OS/2 advisors there too, all helping explain things to users of all skill levels. The two fora are of a Q&A nature. We also place files on CompuServe - CSDs, code, this newsletter, and other things when needed. They're in Library Section 4 and Library Section 5.

## Internet

Yes, we do help you on the Internet.<sup>5</sup> You should direct your queries to cset2@vnet.ibm.com and workframe.vnet.ibm.com. They'll either be answered directly by the IBMers who monitor the Internet or, if that's not possible, forwarded to the person who can help. You may receive email back, or a phone call; it depends on what you ask.

Whichever method you use to ask us for help, please use your Customer Reference Number wherever possible. That way we know exactly who - and where - you are. If you don't have a CRN yet, you'll get one when you return your registration card.

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## Hands Across the Sea

As you'll have read in the previous article, some non-IBMLink customers are able to talk directly to the C Set team through the C-SET2 CFORUM. These customers are those on the EMEA DAP network, and we owe this joining of North Americans and Europeans to some code called GHostnet. Customers' appends on the DAP network are shadowed to the IBM TalkLink BBS's and then, along with "regular" TalkLink appends, shadowed into the appropriate CFORUM on the IBM internal network, our VM host machines (hence Ghostnet). In other words, the Ghostnet code links the three together so we can all talk to each other - US customers to EMEA customers, and both of them to us, both directions. It's fast and easy. We find out even more about what our customers are doing with our product, customers help each other, and we all make new friends. To quote a European customer: it's a dream come true.

For information on TalkLink, call 1-800-547-1283. For details of how to join the EMEA DAP, send a fax to 44 (for the UK) 256 336778.

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<sup>5</sup> There's also an Internet mailbox for the World Wide DAP (Developer Assistance Program). If you have questions about the program, or want to join, you can write to wwdap@vnet.ibm.com.

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## Inquiring Minds Want to Know

There's one area of any software product that always generates discussion: documentation. No matter how well something is written, whatever the quality of the paper, whoever the author is, we all have opinions on what was written and how it was said. We want a little more (or less!), we want it laid out differently, we feel things might be better expressed another way. In the past we've asked you what you think of C Set + + the product, the support, the marketing. Now we're asking again for your help. How do you feel about our documentation? Please take a few minutes to complete our survey and mail/fax/email us your feedback. We want to improve our manuals - if you think we need to - if you think they're just fine the way they are, we're happy to know that too!

### C Set + + Documentation Survey

Please help by answering the questions in this survey and returning it to us at:

| Method         | How to reach us  |
|----------------|--|
| Mail           | Pull the survey from the middle of the newsletter, fold and mail |
| Fax            | Canada 416-448-6057, attention Kathryn Fryer                     |
| External Email | fryerk@torolab4.vnet.ibm.com                                     |
| Internal Email | FRYERK at TOROLAB4   |
| IBMLink        | WZ00086 (Maxine Houghton)  |

Please respond by January 15th, and feel free to add extra pages!

**Note:** Don't forget to identify yourself - please include your name and address when you send in the survey. If you know your CRN, that's all you need to write on the survey to identify you. If you don't know what a CRN is ... Customer Reference Number; you receive one when you return your registration card. It saves a lot of writing.

1. What information units are you using and in which formats? (You can mark more than one if that's what you using. A  $\checkmark$  or an X is fine).

|                                  | <i>Hardcopy</i> | <i>Online<br/>(.INF/HLP)</i> | <i>BookManager<br/>(.BOO)</i> | <i>Postscript</i> |
|----------------------------------|-----------------|------------------------------|-------------------------------|-------------------|
| <i>Technical Library Books</i>   |                 |                              |                               |                   |
| <i>Toolkit references</i>        |                 |                              |                               |                   |
| <i>PM reference</i>              |                 |                              |                               |                   |
| <i>WorkFrame/2</i>               |                 |                              |                               |                   |
| <i>C/C+ + Programming Guides</i> |                 |                              |                               |                   |
| <i>Debugger/EXTRA</i>            |                 |                              |                               |                   |
| <i>Browser</i>                   |                 |                              |                               |                   |
| <i>Class Libraries reference</i> |                 |                              |                               |                   |
| <i>Other</i>                     |                 |                              |                               |                   |

2. Which of the above do you use the most? The least? Why?

3. How do you access or find information in the following:

Format What you use

Hardcopy Which?

\_\_\_ Index

\_\_\_ Contents

\_\_\_ Flip through pages

\_\_\_ Other (please specify)

Online Which?

\_\_\_ Ctrl-H through EPM

\_\_\_ View from command line

\_\_\_ Contextual help (press pf1 or pf2)

\_\_\_ KwikINF

\_\_\_ Index

- ☐ **Contents**
- ☐ **Search**
- ☐ **Other (please specify)**

- |                    |  |
|--------------------|--|
| <b>BookManager</b> | <b>Which?</b><br><input type="checkbox"/> <b>Index</b><br><input type="checkbox"/> <b>Contents</b><br><input type="checkbox"/> <b>Other (please specify)</b> |
|--------------------|--|

**4. Printing from online information**

**Do you print from the online information(IPF or BookManager)?**

**Yes or No** ☐

**How often?** \_\_\_\_\_

**How important to you is the ability to do so?**

**What is an acceptable print quality?**

**5. Why and when do you use the particular information unit in the different formats? (e.g. read the hardcopy on the way to work, to get an overview, use the online for quick reference when stuff ...)**

|               |                     |
|---------------|---------------------|
| <b>Format</b> | <b>What you use</b> |
|---------------|---------------------|

|                 |                   |
|-----------------|-------------------|
| <b>Hardcopy</b> | <b>Used for -</b> |
|-----------------|-------------------|

|               |                   |
|---------------|-------------------|
| <b>Online</b> | <b>Used for -</b> |
|---------------|-------------------|

|                    |                   |
|--------------------|-------------------|
| <b>BookManager</b> | <b>Used for -</b> |
|--------------------|-------------------|

**6. Can you always find the information you're looking for?**

☐ **always**

☐ **often**

☐ **sometimes**

☐ **rarely**

☐ **never**

**How easy/or difficult was it to find?**

☐ **very easy**

☐ **not too difficult but not easy either**

☐ **very difficult**

**How easy/difficult was it to understand when you found it?**



- ☐ *very easy*
- ☐ *not too difficult but not easy either*
- ☐ *very difficult*

7. *What do you like about the documentation we provide? Why?*

8. *What do you like dislike about the documentation we provide? Why?*

9. *What would you change if you could? (format? content? organization? presentation? something else?)*

10. *What format do you prefer for your documentation? (you can choose more than one)*

- ☐ *Hardcopy*
- ☐ *Online*
- ☐ *Context-help*
- ☐ *BookManager*
- ☐ *Postscript*
- ☐ *Other*

11. *Have you a preference for which type of documentation appears in which format?*

12. *Do you like the way we have distributed the C Set + + documentation? (e.g. the amount of hardcopy, of online; which books came hardcopy, which didn't; which came in which format?) What would you change?*

*Thank you very much indeed for taking the time to fill in this survey. We appreciate your effort - your comments are valuable to us, as we evaluate our current documentation.*

**IBM C Set + + News No.6 November 93 issue**

## **Documentation Survey**

*Fold here and tape.....fold here and tape.....fold here and tape.....fold here and tape.....fold here and tape..... fold*

**IBM**

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**Software Services Toronto Lab  
IBM Canada Ltd  
TID - attn: Kathryn Fryer  
21/950/844/TOR  
844 Don Mills Road  
North York  
Ontario, M3C 1V7  
Canada**

*Fold here and tape.....fold here and tape.....fold here and tape.....fold here and tape.....fold here and tape.....fold*

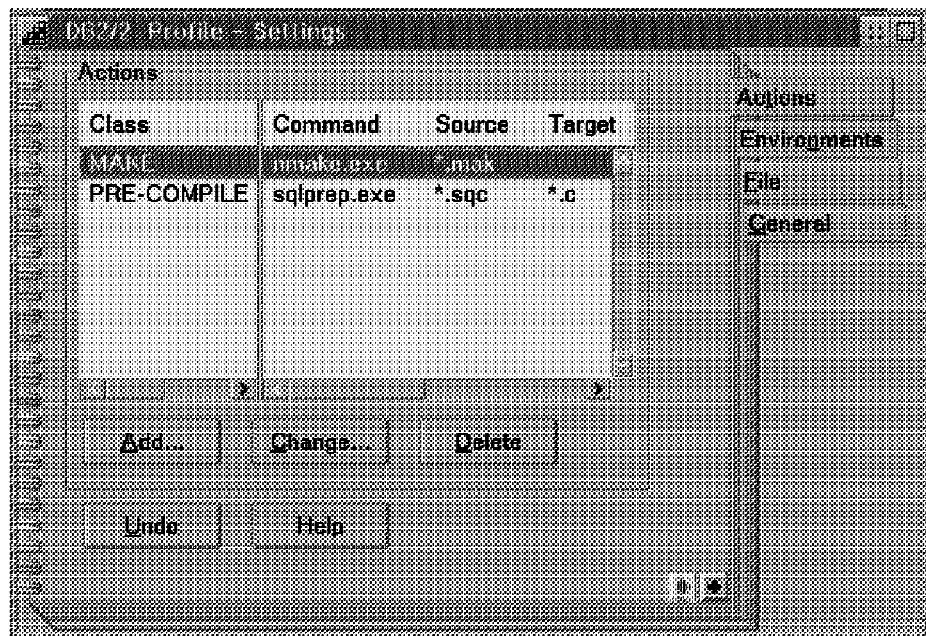
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## Using WorkFrame/2 V2.1 to Enhance DB2/2 Productivity

DB2/2 can be used with the new WorkFrame/2 Version 2.1 application development environment to gain higher levels of productivity.

The first step in integrating DB2/2 is to create an action profile. An action profile is a set of actions associated with one or more projects. Figure 1 shows the settings note book for a DB2/2 Action Profile. Note that the PRE-COMPILE action has been created that identifies the SQLPREP tool.

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Figure 1. DB2/2 Action Profile

The PRE-COMPILE action performs a precompile of the application using SQLPREP and automatically binds the application to the Sample database. PRE-COMPILE will also appear in the icon's pop-up menu. When you want to perform a precompile in the Workplace Shell, just point to the UPDATE.SQC icon and select PRE-COMPILE from its menu (Figure 2).

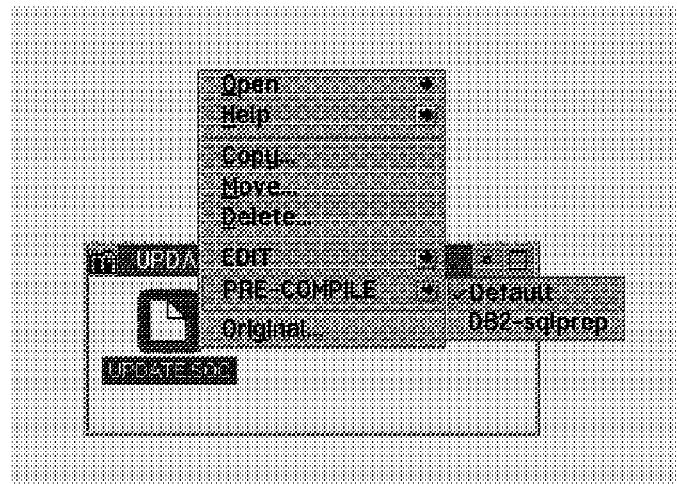


Figure 2. UPDATE.SQC Pop-up Menu

You can choose to display the output from the precompile in a text window, a full-screen window, or a WorkFrame/2 monitor window (Figure 3).

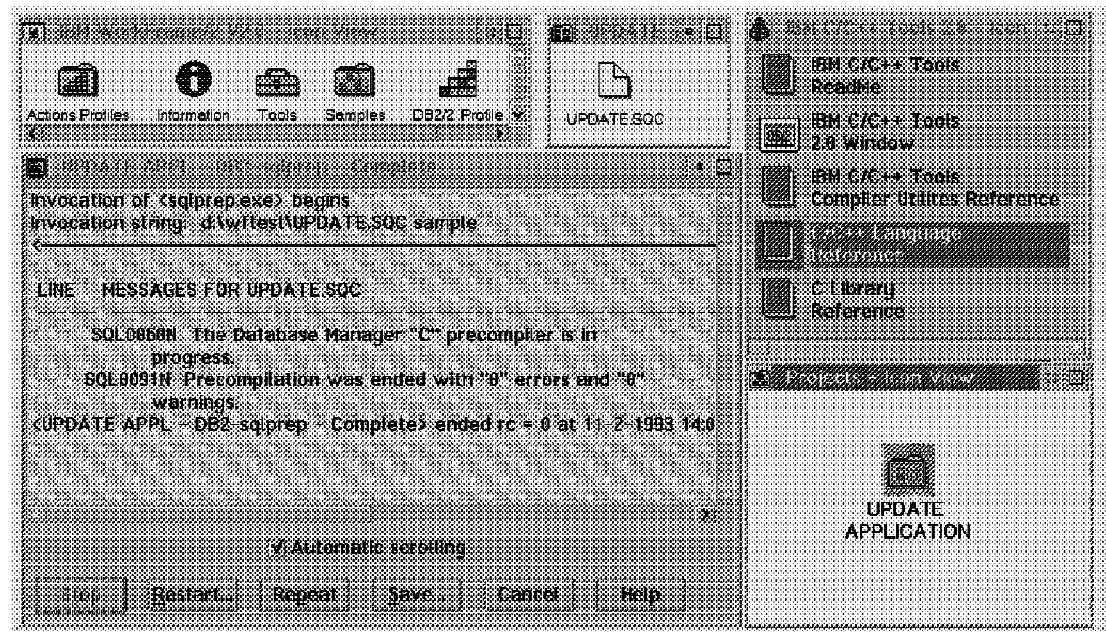


Figure 3. WorkFrame/2 Monitor Window

The output from the PRE-COMPILE action is the file UPDATE.C. UPDATE.C can now be compiled using C Set + + or C Set/2 and linked to create UPDATE.EXE.

For additional information, consult the following DB2/2 and WorkFrame/2 manuals:

- DB2/2 Information and Planning Guide (IBM Doc No. S62G-3662)
- DB2/2 Guide (IBM Doc No. S62G-3663)
- DB2/2 Programming Guide (IBM Doc No. S62G-3665)
- DB2/2 Programming Reference (IBM Doc No. S62G-3666)
- DB2/2 SQL Reference (IBM Doc No. S62G-3667)
- WorkFrame/2 Version 2.1 Introduction (IBM Doc No. S82G-3740)

And don't forget, like us, the DB2/2 team have their own newsletter. If you're interested in receiving it, drop Lou Pedron a note or fax at 416-448-2774 (V), 416-448-2114.

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## Direct Manipulation Support

Robust direct manipulation classes were added to the User Interface C Libraries in C Set + + V2.1, to support drag and drop between the following:

- C Set + + applications
- C Set + + applications and Workplace Shell file, shredder and printer objects

The base direct manipulation classes implement a broad range of features that is found in the PM drag and drop support.

### Classes

There are three major groups of classes within the User Interface Class Libraries. They are Handlers, Items, and Renders.

### Handlers

Handler classes are defined to process direct manipulation events. Static functions are included to automatically create and attach handlers to a window. Default source and target handlers are provided and either or both may be attached to a window. The default source and target handlers handle all events and typically you do not need to derive from these classes.

### Items

Item classes are defined to implement the specifics of the data object that is being manipulated. A generic item class is defined within the library that can be subclassed to define the behaviour of your data object. As a matter of fact, we derive 3 item classes from the generic class in order to support the Container, MLE, and Entry Field con-

trols. In most situations, the item class may be the only class you will need to subclass to provide direct manipulation support for your application.

## Renderers

Renderer classes are defined to facilitate the transfer of data. Source and target renderer classes are defined which recognize several default rendering mechanisms and formats (RMFs) that we include:

- A class library rendering mechanism that supports the following formats:
  - Text format for small (less than 256 bytes) text strings
  - Process format to detect if operation is in the same process
  - Shared memory format which allocates shared memory blocks to handle the rendering of the data

The standard OS/2 rendering mechanisms for file, shredder, and print are also supported.

## Sample

As previously mentioned, derived classes are provided to support the Container, MLE, and Entry Field controls. We have provided a sample program below that illustrates the container support. The 2 lines of code in the main() function is all the code that is required to enable drag and drop for the sample program. You can copy or move objects either within or between containers in this sample. However, please note that these two containers are within the same process, which greatly simplifies the task. A sample has been included in the C Set ++ V2.1 product which demonstrates copies between containers in separate processes.

```

#include < iframe.hpp>
#include < ititle.hpp>
#include < icnr.hpp>
#include < idmhndlr.hpp>

#include "sample.h"

class MyWindow : public IFrameWindow {
/*****
/* This is the demo window class for the sample program.
*****/

public:
/*----- Constructor/Destructor -----
| Objects of this class are constructed by providing the following:
| o A window ID
|-----*/
    MyWindow ( unsigned long windowId );
    ~MyWindow ( ) {};

    IContainerControl
    *cnr() { return(cnrCtl); }

private:
    IContainerControl *cnrCtl;
    IContainerObject *space,
                    *starfleet;
};

/*-----
| main
|-----*/

void main()
{
    MyWindow myWin1 (1000);
    MyWindow myWin2 (1001);

    /*****/
    /* Enable direct manipulation for both containers ...
    *****/
    IDMHandler::enableDragDropFor( myWin1.cnr() );
    IDMHandler::enableDragDropFor( myWin2.cnr() );

    IApplication::current().run();
}

/*-----
| MyWindow Constructor.
|-----*/
MyWindow :: MyWindow ( unsigned long windowId ) :
    IFrameWindow ( windowId ),
    cnrCtl ( new ICnrCtl (windowId + 20, this, this, IRectangle() ) ),
    space ( 0 ),
    starfleet ( 0 )
{
/*****/
/* Set the container as the frame client.
*****/
this-> setClient(cnrCtl);

/*****/
/* Create the container objects ...
*****/
this-> space = new IContainerObject ("Astronaut", SPACE);
this-> starfleet = new IContainerObject ("Captain", STARFLEET);

/*****/
/* and add them to the container.
*****/
this-> cnrCtl-> addObject(space);
this-> cnrCtl-> addObject(starfleet);

```

```

/*****
/* Set the container's attributes.
*****/
this-> cnrCtl-> setDeleteObjectsOnClose();
this-> cnrCtl-> hideTitle();
this-> cnrCtl-> showIconView();
this-> cnrCtl-> arrangeIconView();
this-> cnrCtl-> setExtendedSelection();

/*****
/* Add the title
*****/
ITitle title (this, "C Set + + DragDrop");

/*****
/* Size the frame window
*****/
this-> sizeTo( ISize(250, 225) );

/*****
/* and show it ...
*****/
this-> show();
}

+++++ SAMPLE.CPP +++++

#define SPACE 101
#define STARFLEET 102

+++++ SAMPLE.H +++++

#include < os2.h>
#include "sample.h"

ICON SPACE LOADONCALL space.ico
ICON STARFLEET LOADONCALL starflee.ico

+++++ SAMPLE.RC +++++

```

---

## You Ask, We Answer

We've crammed this newsletter full of all sorts of articles for you, and usually in this section, we add loads of Q&As. To avoid this issue becoming the size of a phone directory, we're reducing the hints and tips section. We'll be back to normal next issue.

---

## OS/2 2.1 APIs

With all the new goodies, OS/2 2.1 is heady stuff. Be aware, though, that if you code your application to APIs that are new in OS/2 2.1, the application will not run under OS/2 2.0. To keep you on the straight and narrow, here are the API's that are new for OS/2 2.1.



## WORKPLACE

- wpAddPowerPage
- wpAddPowerViewPage
- wpChangePowerState
- wpEjectDisk
- wpLockDrive
- WPPower (class)
- wpQueryAssociatedProgram
- wpQueryAutoRefresh
- wpQueryDefStatusView
- wpQueryDriveLockStatus
- wpQueryPowerConfirmation
- wpQueryPowerManagement
- wpQueryRefreshRate
- wpSetAssociatedFileIcon
- wpSetAutoRefresh
- wpSetDefStatusView
- wpSetPowerConfirmation
- wpSetPowerManagement
- wpSetRefreshRate

## MESSAGES

- WM\_MOUSEMAP

The 2.1 tools will execute on GA. Restrictions:

- Use of the kernel debugger can only be used on the same level of OS/2 2.1.
- Applications built with the toolkit will not run on 2.0 if they use the new 2.1 APIs. These include:
  - DosProtectClose
  - DosProtectEnumAttribute
  - DosProtectOpen
  - DosProtectQueryFHState
  - DosProtectQueryFileInfo
  - DosProtectRead
  - DosProtectSetFHState
  - DosProtectSetFileInfo
  - DosProtectSetFileLocks
  - DosProtectSetFilePtr
  - DosProtectSetFileSize
  - DosProtectWrite
  - WinCheckInput
  - WinLockPointerUpdate
  - WinQuerySysPointerData

- WinQueryVisibleRegion
- WinSetPointerOwner
- WinSetSysPointerData
- WinSetVisibleRegionNotify
- WinUnlockSystem

---

## Two for One

A user recently asked: can I use both C Set/2, and C Set + + on the same system? This can be useful when I'm migrating applications from the original release to the next.

You too may be pleased to know that the answer is yes, you can. The down side is that it'll take a little bit of work, especially if you want to use the two compilers simultaneously. The parts of the product that are common between the two releases (the C compiler and the PMD debugger) use the same names for executables, DLLs, header files, and environment variables in both releases.

This fact means that using both compilers on the same system is not as simple as adding the necessary information for both compilers to your CONFIG.SYS, and compiling away. For example, the PATH environment variable is used to find the directory containing the compiler executables. The compiler whose directory is listed first in the PATH will always be executed first. The other poor compiler will be left out in the cold!

But don't despair, there's an easy solution. Instead of using the settings of the C Set environment variables in the CONFIG.SYS file, where the settings will apply to every session, use command files to set the environment variables for the current session to the compiler of your choice. In fact, if you choose not to update your CONFIG.SYS when installing C Set/2, or C Set + + , the installation program will create a command file called CSETENV.CMD which will do just what you want. If you didn't have C Set installation create the file, don't worry, here's all you need.

Assume the compiler is installed in the **ibmc** directory of the **x** drive:

```
SET PATH= x:\ibmc\bin;% PATH%
SET DPATH= x:\ibmc\locale;x:\ibmc&bhelp;% DPATH
SET BOOKSHELF= x:\ibmc\help;% BOOKSHELF%
SET HELP= x:\ibmc\help;% HELP%
SET LIB= x:\ibmc\lib;% LIB%
SET INCLUDE= x:\ibmc\include;% INCLUDE% ;
```

Note that these are the settings COMMON to the two compilers; there are additional settings for some of these variables, and further

variables that are specific to C Set + + . Since they are specific to one of the compilers, they can be safely set in CONFIG.SYS.

Of course, you can create a program object to create a session with the appropriate environment set up. In fact, you'll find one that uses CSETENV.CMD in the C Set + + folder. To create an object for yourself, drag the Program template from the Templates folder to the folder (or desktop) in which you want to create your program object. When you drop the template on the folder, the Settings notebook for the object will be launched. Place a \* in the "Path and file name" field, and the path and name of your command file in the "Parameters" field. For example, to use CSETENV.CMD from D:\ibmcpp:  
/K d:\ibmcpp\csetenv.cmd

The /K option is required. You can then select the "General" tab to change the name of the session.

Still with us? The use of command files to set environment variables for each session will solve most of our problem, but there is one difficulty left. The LIBPATH variable which tells your system where to search for DLLs can only be set in the CONFIG.SYS, and will apply to all sessions. Since the library, and PMD debugger DLLs for C Set/2, and C Set + + , have the same names, it would seem to be impossible to use both products simultaneously. To make matters even more difficult, the C Set + + compiler executables are dynamically linked to the library DLLs. However, to be able to use one compiler at a time, add a command to your command file to create C Set/2, or C Set + + sessions to copy the DLLs from the DLL directory of the appropriate release to a new directory. If you place this directory in the LIBPATH before the DLL directories of either of the two compilers, then when you're working in a session, you'll get the correct DLLs.

Finally, there is a way to use the DLLs from both compilers simultaneously, but it will require further work on your part. It involves the use of the DLLRNAME utility included with C Set + + , to rename the DLLs from one release of the product. Because the C Set + + compiler uses the DLLs, it is easier to rename the C Set/2 DLLs. Here's what you need to do:

1. Edit the def files for the import libraries:

- DDE4SBS.DEF - single-thread standard import library
- DDE4SBM.DEF - single-thread migration import library
- DDE4MBS.DEF - multithread standard import library
- DDE4MBM.DEF - multithread migration import library
- DDE4NBS.DEF - subsystem import library

2. in each DEF file replace the name of the import library in the LIBRARY statement with your own unique name, which must be the same length as the original name. For example, in DDE4SBS.DEF, change:

```
LIBRARY DDE4SBS INITINSTANCE TERMINSTANCE
```

with:

```
LIBRARY FRED SBS INITINSTANCE TERMINSTANCE
```

3. Rebuild each import library with the IMPLIB utility. For example, to rebuild DDE4SBSI.LIB:

```
IMPLIB DDE4SBSI.LIB FRED SYS.DEF
```

4. Build the startup code into the import library. For example:

```
LIB DDE4SBSI.LIB+ DDE4SBSO.LIB
```

5. Finally, use the C Set + + DLLRNAME utility to rename the actual DLLs. To continue our example with DDE4SBS:

```
DLLRNAME DDE4SBS.DLL DDE4SBS= FRED SBS
```

As well as the library DLLs, remember to rename the IPMD DLLs. The DLLs you need to rename are:

- DDE4BE32.DLL
- DDE4BER.DLL
- DDE4CRT.DLL
- DDE4CRTP.DLL
- DDE4MODL.DLL
- DDE4PMDB.DLL
- DDE4RESS.DLL

You'll also need to run the executable for PMD through DLLRNAME to ensure that it loads the correct DLLs:

```
DLLRNAME IPMD.EXE DDE4BE32= newname1 DDE4BER= newname2 DDE4CRT=
DDE4CRTP= newname4 DDE4MODL= newname5 DDE4PMDB= newname6
DDE4RESS= newname7
```

where newname1, newname2, etc are the names you renamed the DLLs.

Of course, if you rename the DLLs from C Set/2, you won't have to copy the DLLs from each release to a new directory when setting up a release-specific session.

You're now set to use two versions of C Set at the same time. With the announce of C Set + + V2.1, take note that this hint allows you to use C Set/2 with either of C Set + + V2.0, or C Set + + V2.1. You could conceivably use V2.0 with V2.1, but that's a little more complicated. Maybe next time.

---

## Stamps Again

No, not postage stamps (although we still collect those), but a short dissertation on the FWDSTAMP utility:

This little utility has been part of the OS/2 2.0 toolkit since its initial release. It's useful if you are providing an application with a user Application Programming Interface (API). Let's assume you are providing an application made up of several DLL's, and are providing APIs to a user, and these API's are scattered among your DLLs.

Providing the APIs to a user via an import library is no problem (you use IMPLIB from the toolkit). However, repartitioning your APIs between the DLLs is no longer possible, since your DLLs are explicitly referenced in the import library. This can create problems when you create the next release of your application.

FWDSTAMP provides a way to provide a fixed user interface, while allowing you to repartition your API. What it does is create a "forwarding stamps" as DLL entry points. These tell the OS/2 loader that the entry point is actually located in some other DLL. These forwarding stamps have only a small time penalty when your application loads, and no time penalty during execution.

By creating an "interface DLL" made up mainly of forwarding stamps, you can now hide the partitioning of your API's code from the user of the API. The library you provide to your user refers only to the "interface DLL", and references none of your other DLLs. The references to your other DLLs is hidden inside the interface DLL. By fixing the ordinal numbers of the interface DLL, you can provide upward compatibility for your application's API without regard to which DLL contains which API.

Further questions? Write to us using the Reader's Reply Form at the end of this newsletter, or contact Roger Pett (73251,1733 on CompuServe).

---

## Roger Wilco

The fwdstamp article mentioned Roger, one of our developers, the one who provided the hint. Many of you may know Ian Ameline as our main compiler CompuServe rep, and you're probably wondering why we're talking about Roger. Ian has moved to the Browser group from the main compiler area, so he's handed over his mantle to Roger. Ian will remain on CompuServe where he'll now focus on

Browser inquiries. We know Roger will be welcomed by all those who haunt our fora.

For those who don't know, there are over a dozen of us who monitor the fora on CompuServe, so if you're looking for help on any component of C Set + + , we have you covered.

---

## Using C Set from the CD-ROM

Yes, you can use C Set direct from the CD-ROM, thereby saving hard disk space. It's not difficult to do, but there are some limitations. In this hint, we've not addressed using WorkFrame/2 in this way - it doesn't take a lot of hard disk. Instead we're concentrating on the Toolkit and C/C+ + Tools which take up most of the space C Set requires.

Before we tell you how, take note of the following:

- Corrective Service (CSDs) cannot apply to CD-ROM.

If you require any fixes or code from a CSD, you have to have the component (that the fixes are for) of C Set on your hard drive.

- Running sample programs cannot be done.

Since sample programs usually generate files, and because CD-ROM is a read-only media, running the sample programs in CD-ROM-direct mode will fail.

- Performance may suffer

Since CD-ROM access time and transfer rate are usually considerably slower than hard drive, running Toolkit and C/C+ + Tools in CD-ROM-direct mode will cause performance degradation. You might consider leaving some often used EXEs or DLLs on your hard drive to balance out performance vs hard disk usage.

### How to make it happen

**If you have Toolkit already installed on your hard drive, but you want to use the Toolkit off the CD.**

1. Change drive to your CD-ROM drive.
2. Change directory to \toolkt21\os2bi.
3. Type tk21desk.

4. When prompted "Is OS/2 Toolkit 2.1 information correct? (Y/N)", answer N.
5. When prompted "Re-enter the Drive that contains Toolkit 2.1", type your CD-ROM drive letter. (e.g. L:)
6. When prompted "Is OS/2 Toolkit 2.1 in drive L:? (Y/N)", answer Y.
7. The tk21desk program will display information on where your OS/2 system is and where the Toolkit is. If the information is correct, answer Y when prompted "Do you want to continue (Y/N)?".
8. Answer Y when prompted "Do you want to update CONFIG.SYS? (Y/N)".
9. The CONFIG.SYS and desktop folder are now updated to use the Toolkit off the CD-ROM. You can now delete the Toolkit from your hard drive.

**Note:** : if you want to go back to using TK on the hard drive, you simply reinstall TK. The reinstallation will update the config.sys and the desktop automatically.

**If you have C/C++ Tools already installed on your hard drive, but you want to use the C/C++ Tools off the CD.**

1. Create a .c file with the following code:

```
#define INCL_WINSHLDDATA
#include < os2.h>
#include < stdio.h>

main() {
    BOOL success;
    success = PrfWriteProfileString( HINI_USERPROFILE,
                                    "IBMCPP201", NULL, NULL );
    if (success == FALSE)
        printf("unable to delete IBMCPP201 entry from os2.ini\n");
    else
        printf("IBMCPP201 successfully removed from os2.ini\n");
    return;
}
```

2. The .c code will remove the C/C++ Tools Version 2.01 entry in the OS2.INI system file. Compile and run the .c program. You should see "IBMCPP201 successfully removed from os2.ini" displayed after you ran the program.
3. Change drive to your CD-ROM drive.
4. Change directory to \ibmcpp.
5. Type cppinst.

6. Select 'Proceed' when the installation says "cannot find the information from the previous C/C++ Tools installation". Consider the installed version of your CD-ROM as your previous installation of C/C++ Tools.
7. Select 'OK' when the installation displays your CD-ROM drive and the directory \ibmcpp.
8. The installed version on the CD-ROM has all options installed. When the installation displays the options from the "previous" installation, you will see all the options were selected. Select 'Update' to update your desktop and CONFIG.SYS.
9. Specify a local directory for DDE4XTRA.SYS and CSE-TENV.CMD. A minimal set of files are needed to be installed on your hard drive. You can specify any hard drive you want including the drive where you previously installed to. Make sure you do not erase these minimal set of files on your hard disk.
10. Select 'Yes' when prompted "Update CONFIG.SYS?".
11. The CONFIG.SYS and desktop folder are now updated to use the C/C++ Tools off the CD-ROM. You can now delete the C/C++ Tools from your hard drive except the following:
  - The minimal set of files DDE4XTRA.SYS and CSE-TENV.CMD on your hard disk.
  - IBMCPP\WKFRAME directory if you want to keep your WorkFrame/2 samples. You cannot run the WorkFrame/2 samples off the CD because it will create files, and since it is a read-only device, it will fail.

**Note:** If you want to go back to use C/C++ Tools on your hard disk, you should run the program again (points 1 and 2) and then reinstall C/C++ Tools on your hard drive.

---

## Back by popular demand

Although we've published this hint before, new users continue to ask about it, so here we are again:

### Using DosCreateThread() vs \_beginthread()

These two functions are similar, but not interchangeable. Either may be used by a C Set/2 multithreaded application, noting the following differences:



| <u>DosCreateThread()</u>  | <u>_beginthread()</u>   |
|---|---|
| Thread function must have linkage type <code>_System</code> .   | Thread function must have linkage type <code>_Optlink</code> .                      |
| Does not register a C Set/2 exception handler for the new thread. You must do this yourself with <code>#pragma handler()</code>                                     | Registers a C Set/2 exception handler for you on the new thread.                    |
| Thread should never terminate by a return. It should always terminate with the function <code>_endthread()</code> . See the note on <code>DosExit()</code> , below. | Thread may terminate by either returning, or by calling <code>_endthread()</code> . |

Figure 4. Differences

### Using `DosExit()` vs `_endthread()`

These functions are similar, but `DosExit()` should never be used to exit a thread. `_endthread()` frees storage allocated by the C Set/2 library for the thread.

## I Was Using the Browser ....

For those of you who aren't making use of the Browser in C Set ++ , here are a few basic answers that might get you started.

| Question                              | Answer   |
|---------------------------------------|--|
| Q: Why would I want to use a Browser? | Program Understanding!!: Suppose you were assigned to a project for the first time with thousands of lines of code to support. Or suppose you want to use the IBM Class Libraries and have no idea where to begin. The Browser is the right tool for you. It was created with the purpose of helping developers better understand source code. |

| Question   | Answer  |
|--|---|
| Q: Why is the IBM Browser better than other ones?          | <p>It provides number of features not found in other browsers, including</p> <ul style="list-style-type: none"> <li>• graphical source code view</li> <li>• extensive search and query facilities</li> <li>• full context-sensitive on-line help and useful tutorial</li> </ul>   |
| Q: Why can't the Browser text window find my source files? | <p>This problem is usually seen in one of two scenarios:</p> <ul style="list-style-type: none"> <li>• you have installed the C Set+ + product in a directory other than C:\IBMCPP and you can't see the source for the \IBMCPP\SAMPLES\BROWSER\payroll.brs file, or</li> <li>• you have moved your source files after generating the browser (*.BRS) files.</li> </ul> <p>When the compiler generates browser files, the original pathname is contained within the browser file itself (e.g., for the sample file it is C:\IBMCPP\SAMPLES\BROWSER). So the browser will be unable to locate these hardcoded pathnames in the text window. If possible, the best solution is to recreate your .BRS files from the source files; this will place the correct pathnames in the new browser files.</p> <p>An alternative is to use the /S option to specify the directory where your source files can be found for this browser file. For example, assume that you have installed C Set+ + onto D:\IBMCPP (instead of on C:), you can invoke the browser on the command line by:</p> <pre>CD D:\IBMCPP\SAMPLES\BROWSER IBRS.EXE /S. PAYROLL.BRS</pre> <p>If you are using Workframe/2 then you can modify the parameter invocation string for the browser, by choosing pull-down Configure, option Tools, choosing C+ + Browser, and Change, and adding to the end of 'Invocation string:' the string "/S% d" so it looks like:</p> <pre>% f /S% d</pre> <p>If you are drag/dropping browser files on the C+ + Browser Icon in the IBM C/C+ + Tools 2.0 folder, then you can modify the Parameters setting to:</p> <pre>/S% **P % *</pre> |

| Question  | Answer   |
|---|--|
| Q: How do I create browser files?                       | <p>(1) The compiler provides a /Fb+ option to create browser files. You may also want to use the /Fo- option to tell the compiler not to generate object files, if you are simply interested in browsing source code. For example:</p> <pre>ICC /Fb+ /Fo- payroll.cpp</pre> <p>Creating implicit rules for .BRS targets in the makefiles is also recommended, for example:</p> <pre>{,}.CPP.BRS: ICC.EXE /Fb+ /Fo- .\\$.CPP</pre> <p>(2) Under Workframe/2, choose the "Browser" option is checked in the Compiler Options. Also see A1, above regarding implicit makefile rules.</p>  |
| Q: How can I load more than one browser file at a time? | <p>(1) The command-line supports wildcard characters and the load window under the Database/Load... option of the control window supports multiple selection of browser files.</p> <p>(2) Under Workframe/2, you should only load one browser file initiall using the Tools menu item. Note that you must select a file before starting the browser. If you select 2 browser files, and invoke the browser via the Tools Menu, then 2 copies of the browser are started, not one with 2 data files.</p> <p>(3) Using the C+ + Browser Icon in the IBM C/C+ + Tools 2.0 folder, you should double click on the application, then load your browser files from the "Load" dialog which is displayed. Do not drag/drop more than one browser file onto the Icon, since a separate copy of the browser will be started for each file so dropped.</p> |

| Question  | Answer   |
|---|--|
| Q: I am not interested in knowing about all the C, C++ , and OS/2 header file stuff. I am mainly interested in knowing about my program or library. How can I exclude information found in the browser files? | <p>Use the /X option on the command-line to exclude facts from certain directories, such as C:\IBMCPP\INCLUDE. For example:</p> <pre>IBRS.EXE /XC:\IBMCPP\INCLUDE MYFILE.BRS</pre> <p>If you always want to exclude the same header file information, and you are using Workframe/2 then you can modify the parameter invocation string for the browser, by choosing pull-down Configure, option Tools, choose C++ Browser, and Change, then adding to the end of 'Invocation string:' the string "/X&lt; path&gt; " so it looks like:</p> <pre>% f /XC:\IBMCPP\INCLUDE</pre> <p>If you always want to exclude the same header file information, and you are drag/dropping .BRS files on the C++ Browser Icon in the IBM C/C++ Tools 2.0 folder, then you can modify the Parameters setting to:</p> <pre>/XC:\IBMCPP\INCLUDE % *</pre> |

---

## New York, New York!

The C Set team attended many shows during the year and continue to do so. For you, it's a chance to take a look at the latest developments, and just to chat. For us, we can show you our products, answer questions, and maybe fix a problem for you. We always enjoy meeting you there, and invite you to stop by when you can,

On February 3rd 1994, one of the developers from the C++ compiler area of the team, will be at the C++ and C SIG meeting in New York. He will talk about and demo V2.1 of C Set ++ . This will be an excellent opportunity to talk to a C++ developer for the evening The venue is expected to be the Conference Centre at IBM in New York.

If you would like more details, or wish to attend, please contact Saul Rosenberg about this session at email "rosenbergs@decus.org". Internet, AOL, AT&T mail, BIX, CompuServe, Delphi, GENie and MCI addresses are accepted.

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## A Word from your Editor

In response to the many requests we have received, this newsletter is now available softcopy. We're now available on the OS2BBS of IBMLink, and in Section 5 of CompuServe. In addition, it has been posted, with permission, on several other nets. Please contact us if you have any questions about posting electronically.

If you didn't receive this newsletter mailed direct from IBM, and you would like regular hardcopy, then let us know. Mail in the reply form at the back with your request to join us, plus your full mailing address, and we'll add you to our mailing list, wherever you are. Yes, wherever you are...from Argentina to Zaire, if you have a mail service, we'll mail you our newsletter.

For the many of you sending in the reply forms with your comments, we've often had the need to call you to discuss your comments further. It's a great help if you include your phone number. Thanks!

This newsletter is available softcopy on several networks. If you obtained your copy electronically, you may not be on the C Set + + mailing list. If you're not, you're missing out! You're not receiving the product information, information updates, and other general mailouts that others are. You can be on our list for these goodies, with or without hardcopy newsletter distribution. Just mail/fax your full address (phone number is handy too) using the Reader's Reply Form at the back of this copy, and circle whether you want the NL hardcopy, or just want to be added to our mailing list.

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*Thank you for your cooperation and help. You can either mail this form to us, or hand it into an IBM office for forwarding.*

*You can also fax the form to us. Our fax is 416-448-6057. Please mark your fax for the attention of MJ Houghton.*

## IBM C Set + + News No.6 November 93 issue

### Reader's Reply Form

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*Fold here and tape.....fold here and tape.....fold here and tape.....fold here and tape.....fold here and tape.....fold*